KT77

Genalex

BEAM TETRODE

BRIEF DATA

A beam tetrode with an absolute maximum anode dissipation rating of 32 watts. The KT77 is designed for use in the output stage of an af amplifier. Two valves in Class AB1 give a continuous output of over 70 W. The KT77 is also suitable for use as a series valve in a stabilised power supply.

HEATER

Heater voltage	6.3	V
Heater current (approx)	1.4	A

MAXIMUM RATINGS

	Absolute	Design Max.	
DC anode voltage	850	800	V
DC screen voltage	650	600	V
DC anode and screen voltage	650	600	V
Anode dissipation	32	25	W
Screen dissipation	6.0	6.0	W
Anode and screen dissipation	35	28	W
DC cathode current	200	180	mA
Heater-cathode voltage	200	150	V
Negative dc grid voltage	220	200	V
Grid-cathode resistor (cathode bias)			
$p_{a+g2} \leqslant 28$ W	1.0		MΩ
$p_{a+g2} > 28$ W	0.5		MΩ
Grid-cathode resistor (fixed bias)			
$p_{a+g2} \leqslant 28$ W	0.5		MΩ
$p_{a+g2} > 28$ W	0.25		MΩ
Bulb temperature	250	230	°C

CAPACITANCES (Measured on a cold unscreened valve)

Grid to anode	1.0	pF
Grid to all other electrodes, less anode	16.5	pF
Anode to all other electrodes, less grid	9.0	pF

CHARACTERISTICS

Tetrode Connection

DC anode voltage	250	V
DC screen voltage	250	V
DC anode current	110	mA
DC screen current	10	mA
Mutual conductance	10.5	mA/V
Internal anode resistance	23	kΩ
Inner amplification factor	11.5	

Triode Connection

DC anode and screen voltage	250	V
DC anode and screen current	120	mA
Mutual conductance	11	mA/V
Internal anode resistance	1050	Ω
Amplification factor	11.5	

TYPICAL OPERATION

Ultra-linear Connection. 43% Taps. Push-Pull. Class AB1. Cathode Bias

V_b	430	V
$V_{a, g2}$	390	V
R_{g2}	2 x 22	Ω
R_k	2 x 470 ±5%	Ω
$R_{L\ (a-a)}$	6.0	kΩ
$I_{a+g2\ (o)}$	2 x 66	mA
$I_{a+g2\ (max\ sig)}$	2 x 80	mA
$p_{a+g2\ (o)}$	2 x 26	W
$p_{a+g2\ (max\ sig)}$	2 x 14	W
$-V_{g1}$	31 (approx)	V
$v_{in\ (g1-g1)\ (pk)}$	69	V
P_{out}	34	W
D_{tot}	2.5	%

Ultra-linear Connection. 43% Taps. Push-Pull. Class AB1. Fixed Bias

V_b	600	500	400	V
$V_{a,\,g2}$	594	493	391	V
R_{g2}	2 x 22	2 x 22	2 x 22	Ω
$R_{L(a-a)}$	9.0	5.5	4.5	kΩ
$I_{a+g2(o)}$	2 x 47	2 x 57	2 x 70	mA
$I_{a+g2\,(max\,sig)}$	2 x 109	2 x 126	2 x 121	mA
$p_{a+g2(o)}$	2 x 28	2 x 28	2 x 27.5	W
$p_{a+g2\,(max\,sig)}$	2 x 28	2 x 28	2 x 24	W
*$-V_{g1}$ (approx)	56	43	31	V
$v_{in\,(g1-g1)\,(pk)}$	94	82	61	V
P_{out}	72	67	45	W
D_{tot}	1.5	1.0	0.8	%

*A bias adjustment range of ±25% about these values should be available for each valve.

Tetrode Connection. Push-Pull. Class AB1

The KT77 is designed primarily for use under ultra-linear conditions and this connection is recommended. However, similar performance can be obtained in the tetrode connected arrangement but the output impedance will be greatly increased. For tetrode connection the fixed screen supply must not exceed 300 V.

Triode Connection. Push-Pull. Class AB1. Cathode Bias

V_b	430	V
$V_{a,\,g2}$	396	V
R_{g2}	2 x 22	Ω
R_k	2 x 440 ±5%	Ω
$R_{L(a-a)}$	5.0	kΩ
$I_{a+g2(o)}$	2 x 69	mA
$I_{a+g2\,(max\,sig)}$	2 x 75	mA
$p_{a+g2(o)}$	2 x 27	W
$p_{a+g2\,(max\,sig)}$	2 x 20	W
$-V_{g1}$	30 (approx)	V
$v_{in\,(g1-g1)\,(pk)}$	66	V
P_{out}	18.0	W
D_{tot}	1.2	%

LIFE PERFORMANCE

The average life expectancy of the KT77 when operated at absolute maximum ratings (see page 1) is at least 5,000 hours. At a reduced absolute rating p_{a+g2} = 25 W a life of at least 10,000 hours should be obtained. The environment must be a static one and the valve should be switched not more than 12 times in each 24 hours.

A valve is considered to have reached the end of life when it is either inoperative or one or more of its characteristics have reached the following values:

Output power	50 % of initial value	
*Mutual conductance	<9.3	mA/V

*Measured at :

DC anode voltage	250	V
DC screen voltage	250	V
DC anode current	100	mA

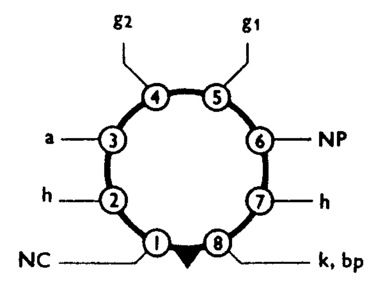
INSTALLATION

The valve may be mounted in any position. Free air circulation around the valve is desirable.

When a pair of valves is mounted horizontally it is recommended that the centres of the valve sockets are not less than 9 cm (3½ in) apart and that the keyways on the spigots of each valve are in the vertical plane.

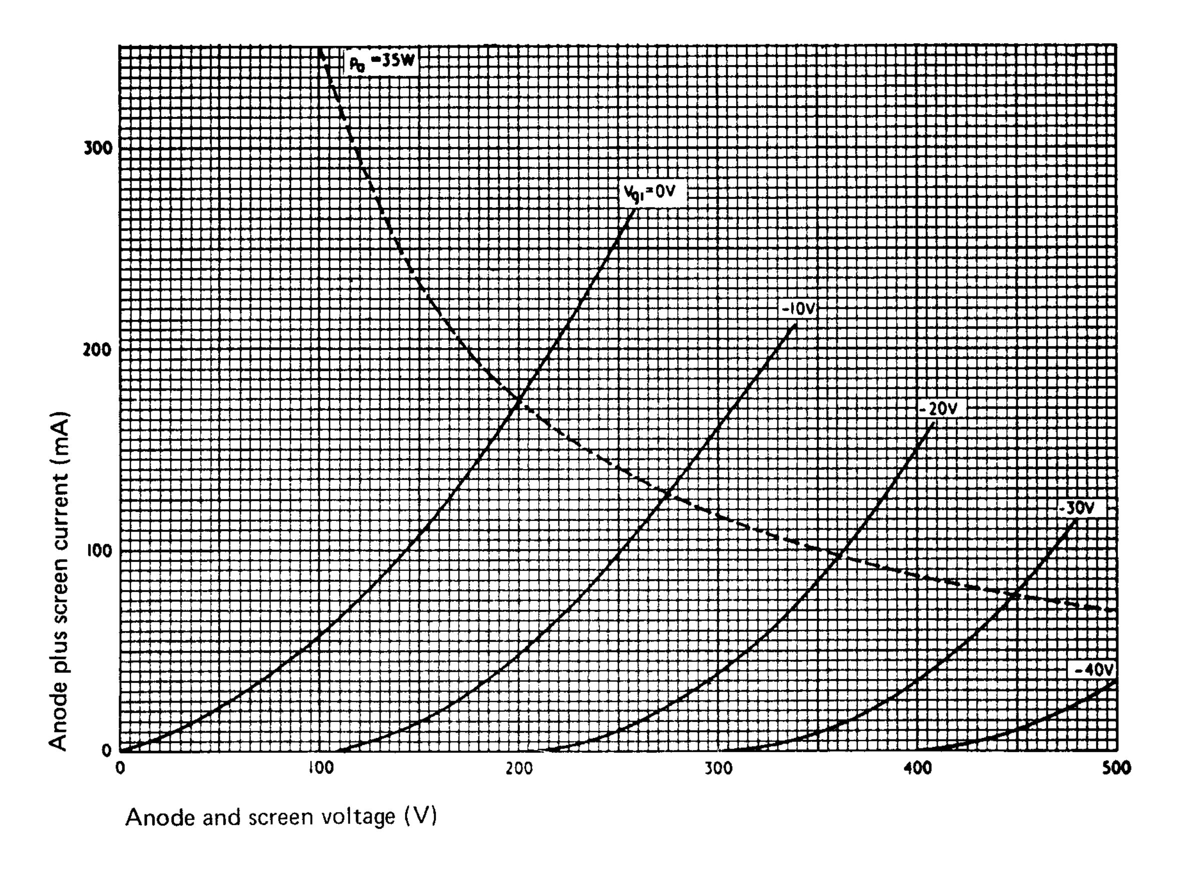
When a pair of valves is mounted vertically it is recommended that the centres of the valve sockets are not less than 9 cm (3½ in) apart and that the keyways on the spigots lie along the line joining the centres.

BASE CONNECTIONS AND VALVE DIMENSIONS

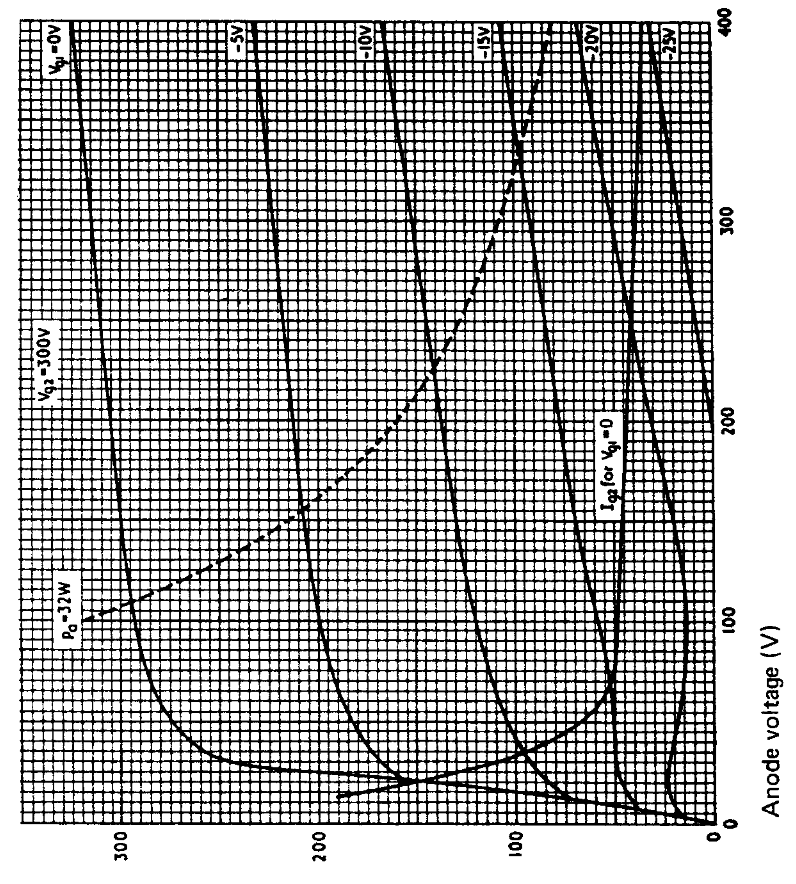


View from underside of base.

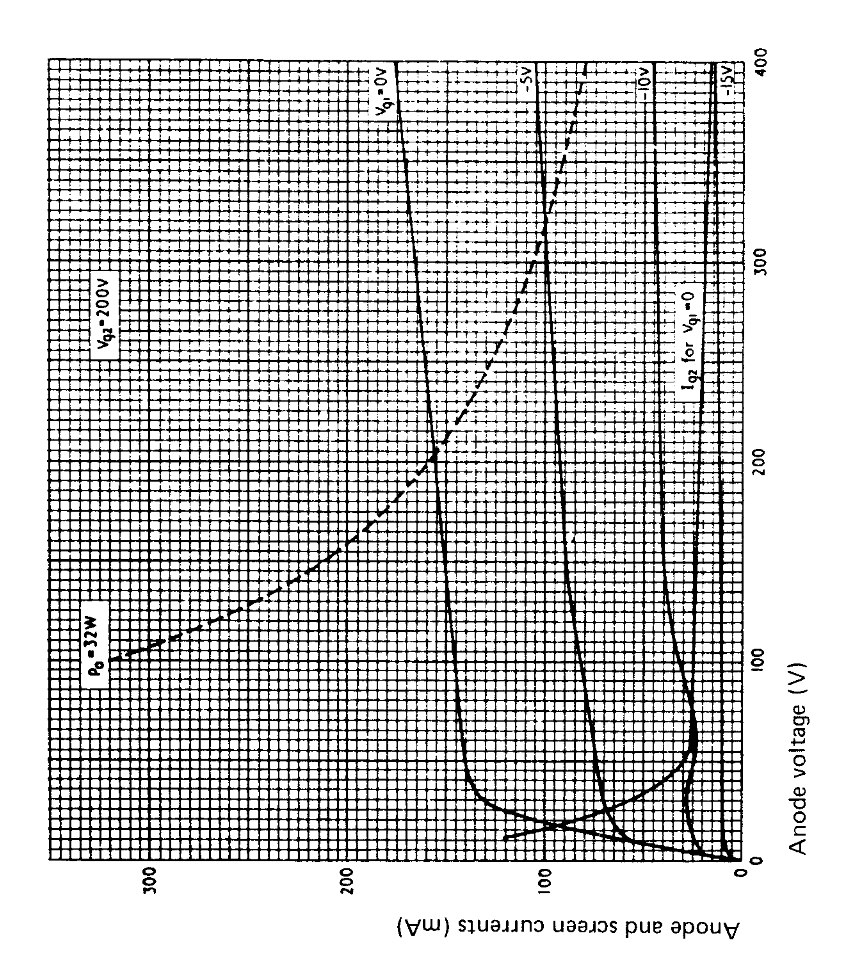
Base :	International Octal (B8–0)
Bulb :	Tubular
Max overall length :	113 mm
Max seated length :	99 mm
Max diameter :	33 mm



Pa = 35W
Vg1 = 0V
-10V
-20V
-30V
-40V
Anode plus screen current (mA)
0
100
200
300
Anode and screen voltage (V)
0
100
200
300
400
500

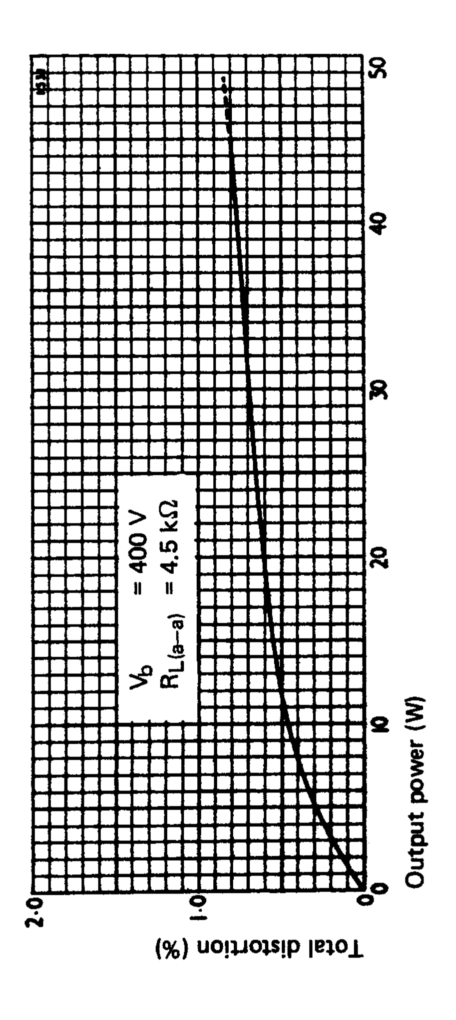


V_{g1}=0V
-5V
-10V
-15V
-20V
-25V
V_{g2}=300V
P_a=32W
I_{g2} for V_{g1}=0
0
100
200
300
400
Anode voltage (V)
Anode and screen currents (mA)

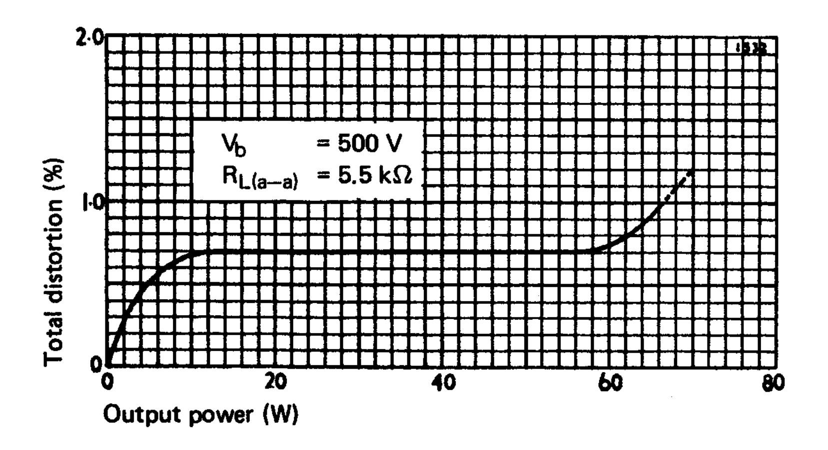


$V_{g2} = 200V$
$P_a = 32W$
$V_{g1} = 0V$
-5V
-10V
-15V
I_{g2} for $V_{g1} = 0$
0
100
200
300
400
Anode voltage (V)
0
100
200
300
Anode and screen currents (mA)

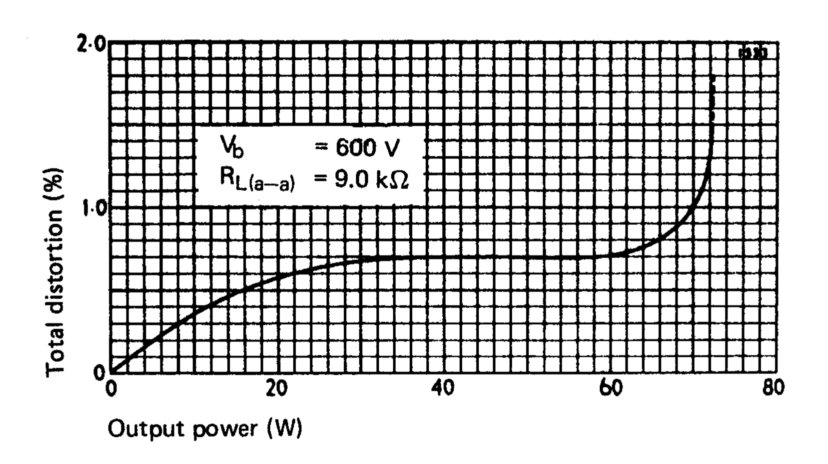
Ultra-linear connection. 43% taps. Push-pull. Class AB1. Fixed bias.



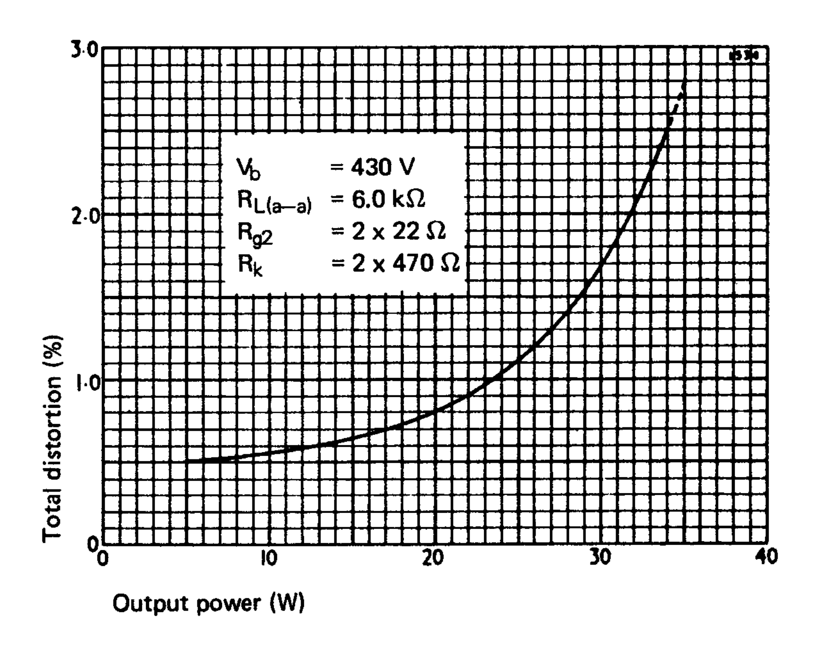
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Ultra-linear connection. 43% taps. Push-pull. Class AB1. Fixed bias.



Ultra-linear connection. 43% taps. Push-pull. Class AB1. Cathode bias.



Triode connection. Push-pull. Class AB1. Cathode bias.

